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EXAMINER	
DOLLINGER, MICHAEL M	
ART UNIT	PAPER NUMBER
4171	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/580,459	CAMINADE ET AL.	
	Examiner	Art Unit	
	MICHAEL DOLLINGER	4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *54-106* is/are pending in the application.

4a) Of the above claim(s) *89-106* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *54-88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I in the reply filed on June 9, 2008 is acknowledged. The traversal is on the ground(s) that (1) Groups I-VII relate to a single general inventive concept namely the dendritic polymers, (2) the unifying technical feature of the dendritic polymers is special because the prior art Matthews et al. (US 6,464,971 B1) does not meet each and every aspect of every claim of Group I, (3) the common technical feature of Groups V and VI is special because each and every permutation of the compound of formula (III) is not listed in the prior art Kagaku (JP 05 178 710), (4) the compound of Group V is not anticipated by Kagaku et al., (5) all the claims were searched in the international phase of the application, and (6) the subject matter of Groups II, III and IV overlaps because all of these processes utilize a common reactant (a compound having one or two functionalities $-PO_3X_2$) and all provide a Group I dendritic polymer. These arguments are not found persuasive because:

(1) Groups I-VII do not relate to a single generative concept as Examiner has shown that Groups V and VI do not make any limitations to a dendritic polymer. Furthermore, Examiner has shown that the single generative inventive concept of Groups I-IV and VII is not a special technical feature and the groups henceforth lack unity of invention.

(2) The prior does not need to meet each and every aspect of the claims of Group I to show lack of unity. The prior only needs to disclose the common technical feature shared by the groups. In the present application, that common technical feature is the

dendritic polymer with phosphonic terminal groups which is shown in several embodiments in Matthews et al. (US 6,464,971 B1).

(3) The prior art does not need to disclose each and every permutation of a claimed compound to anticipate the claimed compound; a single embodiment of a chemical formula is enough to anticipate the formula and render it non-special.

(4) Applicants arguments that Kagaku does not disclose a compound are correct. The reference to Kagaku was a mistake on the part of the Examiner. However, the argument over whether the common technical feature of Groups V and VI is special is moot; lack of unity of invention of this application has already been established in the above arguments in that it has been shown that Groups I-VII do not share a common technical feature.

(5) The decision of the International Searching Authority on unity of invention has no bearing on the determination of unity of invention in the national stage application. Restriction is always optional and at the discretion of the acting examiner.

(6) Groups II, III and IV share the technical features of dendritic polymers with phosphonic terminals which has already been shown to be non-special in the above arguments.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claims 87 and 88 are objected to because of the following informalities: there is an extra "$]_2$" on the right hand sides of the chemical formulae (I-2) and (I-3). Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 67 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. An oxygen atom at the D component of the formula C1 in claim 64 would give the adjacent carbon atom an irregular valence of 5. Examiner suggests that claim 67 be amended to place a different atom of compound that is univalent at the D component of formula C1 in claim 64.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 64, 78 and 84-88 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claims 64 and 85-88, the multitude of variables and possible chemicals listed as suitable for each variable is so large and diverse that the scope of these claims becomes indefinite.

8. Claim 78 recites the limitation "-C(D)=N-N(E)-$(Alk)_a$-" in line 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, Examiner takes the position that D and E are as defined in claim 69 or claim 64.

9. Claim 84 recites the limitation "formula (C1) and (C2), J and K are equal to A and B" in line 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, Examiner takes the position that formula (C1), A, and B are as defined in claim 64 and formula (C2), J, and K are as defined in claim 75.

10. Claim 85 recites the limitation "§-{{A-B-C(D)=N--N(E)-(P(=G))<}^{n} [J-K-$(Alk)_a$-N<[A2-P(=O)$(OX)_2$]$_2$]$_2$}$_m$" in lines 3 and 5. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, Examiner takes the position that the variables are as defined in claims 54, 64, and 75.

11. Claim 86 recites the limitation "§-{{A-B-C(D)=N-N(E)-(P(=G))<}^{n} [J-K-C(D)=N-N(E)-$(Alk)_a$-CH<[A2-P(=O)$(OX)_2$]$_2$]$_2$}$_m$" in lines 3-4 and 5. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, Examiner takes the position that the variables are as defined in claims 54, 64, and 75.

12. Claim 87 recites the limitation "§-{{A'-(C=O)-N(R)-B'-N<}^{n} [A2-P(=O)$(OX)_2]_2]_m$" in lines 3 and 5. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, Examiner takes the position that the variables are as defined in claims 54 and 70.

13. Claim 88 recites the limitation "§-{{A"-N<}^{n} [A2-P(=O)$(OX)_2]_2\}_m$" in lines 3 and 5. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, Examiner takes the position that the variables are as defined in claims 54 and 80.

14. Examiner suggests that the claims be amended so that all the variables are clearly defined and the scope of all the claims is clearly defined as well. Examiner suggests that the dependency of the claims be amended in order to clearly define the variables or that the definitions of the variables be restated several times throughout the claims.

Double Patenting

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. Claims 54, 55, 58, 59, 61-66, 68-70, 72, 75-77 and 80-84 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 60, 62-73, 75-78, 80-83 and 88 of copending Application No. 10/580422. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the instant claims lies within the scope of the copending claims and so the instant claims anticipate the copending claims. It is clear that all the elements of the copending claims are to be found in the instant claims as the copending claims fully encompass the instant claims. The difference between the copending claims and the instant claims is that the instant claims contain more elements and thus outline a more specific invention. Thus the invention of the instant claims is in effect a "species" of the "generic" invention of the copending claims. It has been held that the generic invention is "anticipated" by the "species". See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993). Since the copending claims are anticipated by the instant claims, they are not patentably distinct from the copending claims.

Instant claim	Corresponding Copending Claim
54	60
55	64
56	-
57	-
58	62
59	63
60	-
61	68
62	67
63	69
64	70
65	71
66	72
67	-
68	75
69	76
70	77
71	-
72	78
73	-
74	-
75	80
76	82
77	83
78	-
79	-
80	88
81	65
82	66
83	73
84	81
85	-
86	-
87	-
88	-

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

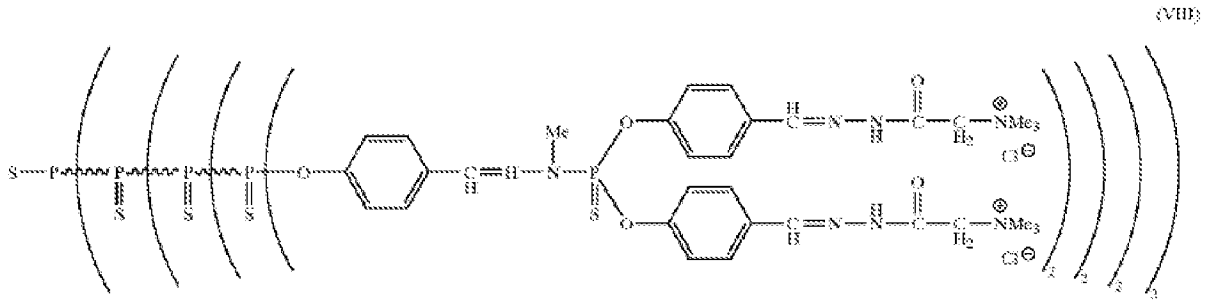
18. Claims 54, 58-66, 68-88 are rejected under 35 U.S.C. 102(b) as being anticipated by Caminade et al. (WO 0053009). Please note that Caminade et al. (US 6,939,831 B1) is used as a translation to Caminade et al. (WO 0053009) according to MPEP 901.05 [R-3] III 4th paragraph.

19. Regarding claim 54, applicants claim a dendritic polymer of generation 0 to 12, a central core of valence of 1 or more, generation and optionally intermediate chains, a terminal group at the end of each intermediate chain represented by the formula (I):

$$-(A1)<[A2\text{-}P(=O)(OX)_2]_2 \qquad (I)$$

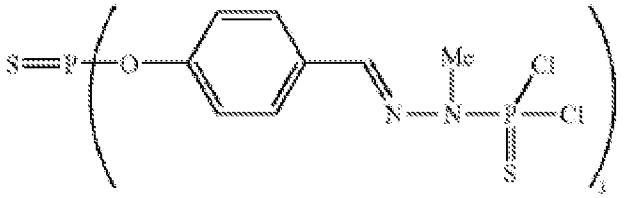
wherein A1 represents the radical --CR< or -Heteroatom<; the radicals A2, which are identical or different, each independently of the other represents a single bond or a linear or branched hydrocarbon chain having from 1 to 6 chain members; X represents a radical -alkyl, -Aryl, -H or /M where M is a cation. Caminade et al. disclose dendritic polymers Caminade et al. disclose a dendritic polymer of one or more generations with core molecule of valence preferable between 3 and 10 (column 14 lines 43-48) wherein the core may be a hexachlorocyclotriphosphazene or trichlorothiophosphane (column 15 lines 1-4), generation and intermediate chains, and with phosphonic type terminal groups (column 13 lines 1-3). Several of the disclosed dendritic polymers would have

terminal groups of the above formula (I) is phosphonated such as polymer of FIG. (VIII) (column 27 and 28 lines 30-40) herein referred to as formula (II):



(II)

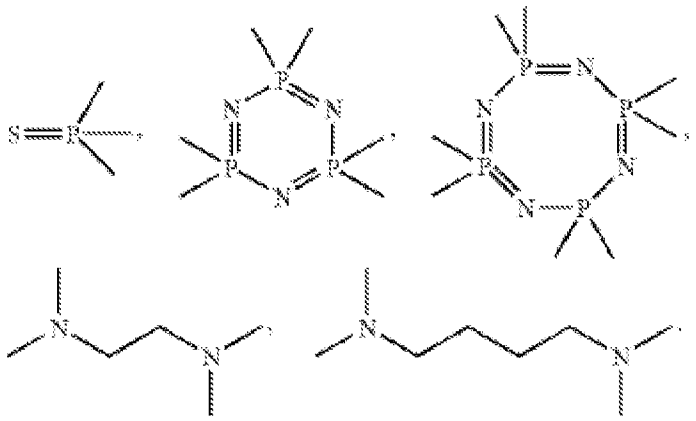
being terminated with a phosphonic compound rather than the Girard PR reagent (column 27 lines 64-65); or any of the dendrimers of FIG. (XI) including one of formula (III):



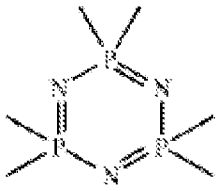
(III)

subsequently phosphonated. In formula (II) for example A1 is P; A2 is O-Ph-CH=N-N(Me)-P(S)< (a six membered Me and thio substituted linear chain); the core valence is 3; the generation is 1; and the phosphonic groups may be added to the P atom through conventional methods.

20. Regarding claims 58 and 59, applicants claim a dendritic polymer wherein the central core contains at least one phosphorous atom or is selected from the following groups:

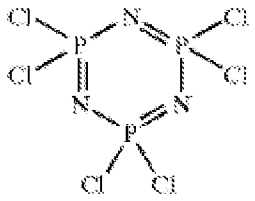


preferably of the formula:

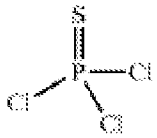


.

Caminade et al. disclose the central core of the dendritic polymer as hexachlorocyclotriphosphazene or trichlorothiophosphane (column 15 lines 1-4; Structures (VI) and (VII)):



(VI)



(VII)

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21. Regarding claims 60 and 61, applicants claim the central core molecule of the dendritic polymer with a valence of 1 to 8 and preferably 3, 4, or 6. Caminade et al.

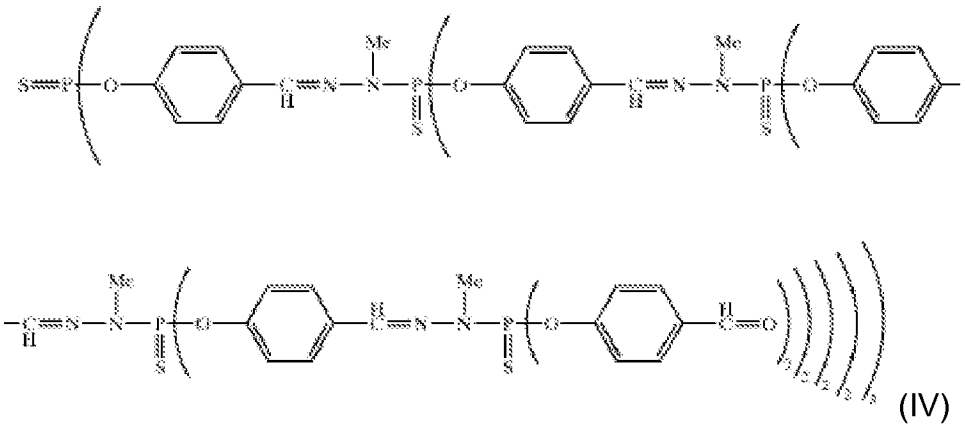
disclose the central core of the dendritic polymer as hexachlorocyclotriphosphazene which has a valence of 6 and trichlorothiophosphane which has a valence of 3.

22. Regarding claim 62, applicants claim the dendritic polymer with 0 to 3 generations. Caminade et al. discloses the polymer of formula (III) having 1 generation.

23. Regarding claims 63-66, 68 and 69, applicants claim generation branch compositions elected from linear or branched hydrocarbon chains having from 1 to 12 chain members wherein the generation chains are of the formula:

-A-B-C(D)=N-N(E)-(P(=G))<

wherein in the most limited embodiments A represents an oxygen atom; B represents a phenyl ring; D represents a hydrogen atom, or a radical -Alkyl, --OAlkyl, -Aryl, or -Aralkyl; E represents a radical alkyl; and G represents a sulfur atom. Caminade et al. disclose the structure in FIG. (XI) (column 38) herein referred to as formula (IV):



(IV)

anticipating the claimed formula wherein A is an oxygen atom; B is an aryl group namely phenylene; C is a carbon atom; D is an hydrogen atom; E is an alkyl radical namely methyl; and G is a sulfur atom. The compound of formula (IV) may be

terminated with phosphonic groups as disclosed in the specification (column 13 lines 1-3).

24. Regarding claim 70 and 71, applicants claim the generation chains represented by the formula:

-A'-(C=O)-N(R)-B'-N<

wherein A' and B' each independently of the other represents a radical -Alkyl, -Alkenyl, or –Alkynyl group. Caminade et al. disclose generation chains composed of acylaminoalkyl groups (column 16 line 8) substituted with amino (column 16 line 28) and alkyl groups (column 16 line 21).

25. Regarding claim 72 and 73, applicants claim the generation chains represented by the formula:

-A''-N<

wherein A'' represents a radical -Alkyl, -Alkenyl, or –Alkynyl. Caminade et al. disclose generation chains composed of alkylamino groups (column 16 line 6).

26. Regarding claim 74-78, applicants claim the intermediate chains as linear and branched hydrocarbon chains having from 1 to 12 chain members and further limited to chains represented by the formula:

-J-K-L-

wherein J represents an oxygen atom, a sulfur atom or a radical -NR-; K represents a radical -Aryl-, -Heteroaryl-, or -Alkyl- and most limited to a phenyl; L represents a hydrocarbon chain having from 1 to 6 chain members and most limited to a radical –$Alk)_a$- or the radical –C(D)=N-N(E)-$(Alk)_a$-. Caminade et al. disclose the structure in

formula (IV) having the same formula as represented above wherein J is an oxygen atom; K is a radical aryl namely a phenylene group; and L is C(H)=N-N(Me)-$(alk)_0$.

27. Regarding claim 79, applicants claim intermediate chains represented by the formula:

-A'-(C=O)-N(R)-B'-N<

wherein A' and B' each independently of the other represents a radical -Alkyl, -Alkenyl, or –Alkynyl group. Caminade et al. disclose generation and intermediate chains composed of acylaminoalkyl groups (column 16 line 8) substituted with amino (column 16 line 28) and alkyl groups (column 16 line 21).

28. Regarding claim 80, applicants claim intermediate chains represented by the formula:

-A”-

wherein A” represents a radical –Alkyl, -Alkenyl, or Alkynyl. Caminade et al. disclose generation and intermediate chains composed of alkyl (column 16 line 2), allyl (column 16 line 5), or propargyl (column 16 line 5).

29. Regarding claims 81 and 82, applicants claim a dendritic polymer wherein M^+ is an element of group IA, IIA, IIB, or IIIA or further claim M^+ is a sodium or potassium atom. Caminade et al. disclose the phosphonic terminated polymer dissolved in a solvent (column19 lines 29-32) and in combination with an alkaline-earth metal salt (column 7 lines 31-34) or various sodium and potassium salts including Metam-sodium (column 8 line 45) and potassium hydroxyquinoline sulfate (column 8 lines 55-56). The

combination of solvent and alkaline-earth, sodium, and potassium salts will effectively create some dendritic polymer with group IIA, sodium, and potassium as the M^+ ions.

30. Regarding claim 83, applicants claim the generation chains as identical. Caminade et al. disclose generation chains with chemical motifs that are in part identical to each other (column 15 lines 33-37).

31. Regarding claim 84, applicants claim the intermediate and generation chains wherein J and K are equal to A and B. The same elements of formula (IV) disclosed in Caminade et al. anticipate both J and K, and A and B.

32. Regarding claim 85, applicants claim a dendritic polymer represented by the formula:

$$\S\text{-}\{\{A\text{-}B\text{-}C(D)=N\text{--}N(E)\text{-}(P(=G))<\}^n\ [J\text{-}K\text{-}(Alk)_a\text{-}N<[A2\text{-}P(=O)(OX)_2]_2]_2\}_m.$$

Caminade et al. disclose dendritic polymers having generation of formula (III) and (IV) corresponding to A-B-C(D)=N--N(E)-(P(=G))<, intermediate chains of alkoxyalkyl (column 16 line 2) corresponding to J and K and aminoalkyl (column 16 line 6) corresponding to $-(Alk)_a\text{-}N<$, and phosphonic terminals (column 13 lines 1-3) corresponding to $A2\text{-}P(=O)(OX)_2$ wherein A2 is a single bond or alkyl group.

33. Regarding claim 86, applicants claim a dendritic polymer represented by the formula:

$$\S\text{-}\{\{A\text{-}B\text{-}C(D)=N\text{-}N(E)\text{-}(P(=G))<\}^n\ [J\text{-}K\text{-}C(D)=N\text{-}N(E)\text{-}(Alk)_a\text{-}CH<[A2\text{-}P(=O)(OX)_2]_2]_2\}_m.$$

Caminade et al. disclose dendritic polymers having generation of formula (III) and (IV) corresponding to A-B-C(D)=N--N(E)-(P(=G))<, intermediate chains of alkoxyalkyl (column 16 line 2) corresponding to J and K and hydrazinoalkyl (column 15 line 13)

corresponding to C(D)=N-N(E)-$(Alk)_a$-CH<, and phosphonic terminals (column 13 lines 1-3) corresponding to A2-P(=O)$(OX)_2$ wherein A2 is a single bond or alkyl group.

34. Regarding claim 87, applicants claim a dendritic polymer represented by the formula:

$$\S\text{-}\{\{A'\text{-}(C=O)\text{-}N(R)\text{-}B'\text{-}N<\}^n\ [A2\text{-}P(=O)(OX)_2]_2]_m.$$

Caminade et al. discloses dendritic polymers having generation and intermediate chains composed of acylaminoalkyl groups (column 16 line 8) substituted with amino (column 16 line 28) and alkyl groups (column 16 line 21) and phosphonic terminal groups (column 13 lines 1-3).

35. Regarding claim 88, applicants claim dendritic polymer represented by the formula:

$$\S\text{-}\{\{A''\text{-}N<\}^n\ [A2\text{-}P(=O)(OX)_2]_2\}_m.$$

Caminade et al. disclose a dendritic polymer having generation chains composed of aminoalkyl groups (column 16 line 6), intermediate chains composed of alkyl groups (column 16 line 2) and having phosphonic terminals (column 13 lines 1-3).

36. Claims 54-57, 60-62, 70-73, 79, 80, 87 and 88 are rejected under 35 U.S.C. 102(b) as being anticipated by Killat et al. (US 4,871,779).

37. Regarding claim 54, applicants claim a dendritic polymer of generation 0 to 12, a central core of valence of 1 or more, generation and optionally intermediate chains, a terminal group at the end of each intermediate chain represented by the formula (I):

$$\text{-}(A1)<[A2\text{-}P(=O)(OX)_2]_2 \qquad (I)$$

38. wherein A1 represents the radical --CR< or -Heteroatom<; the radicals A2, which are identical or different, each independently of the other represents a single bond or a linear or branched hydrocarbon chain having from 1 to 6 chain members; X represents a radical -alkyl, -Aryl, -H or /M where M is a cation. Killat et al. disclose dense star polymers (column 2 lines 26-27) with at least one dendritic branch (column 2 line 27), at least two terminal ion exchange moieties on each dendritic branch (column 2 lines 28-29) that is preferably phosphonate or phosphonium (column 6 lines 58-61). The dendritic polymer may have a PAMAM (polyamidoamine) structure, a ternary or trivalent core molecule, and second generation dendritic branches (column 10 lines 15-18). The biphosphonic terminals can be added through the direct reaction of the $-NH_2$ ends of the dendrons with chloromethylphosphonate (column 7 lines 19-24). This dendritic polymer would have a core valence of 3 or 4; generation of 2; A1< is the radical N<; X is H; and A2 is methyl.

39. Regarding claim 55, applicants claim a dendritic polymer having a structure of the DAB, PAMAM, or PMMH type. Killat et al. disclose a dendritic polymer of the PAMAM type (column 10 lines 15-16).

40. Regarding claim 56, applicants claim the dendritic polymer wherein A1 represents the radical -CH< or -N<. Killat et al. disclose a dendritic polymer that is biphosphonated by directly reacting the $-NH_2$ end of the dendrons with chloromethylphosphonate (column 7 lines 19-24); this dendritic polymer will have terminals wherein A1 is the radical -N<.

41. Regarding claim 57, applicants claim a dendritic polymer wherein A2 represents –Me-. Killat et al. disclose a dendritic polymer that is biphosphonated by directly reacting the -NH_2 end of the dendrons with chloromethylphosphonate (column 7 lines 19-24); this dendritic polymer will have terminals wherein A2 is an –Me-.

42. Regarding claim 60, applicants claim a dendritic polymer with a core with valence 1 to 8. Killat et al. disclose a core molecule with a valence from 2 to about 2,300 (column 10 lines 47-48).

43. Regarding claim 61, applicants claim a dendritic polymer with a core with valence 3, 4 or 6. Killat et al. disclose a core molecule that is ternary or trivalent (column 10 line 15).

44. Regarding claim 62, applicants claim a dendritic polymer with 0 to 2 generations. Killat et al. disclose a dendritic polymer with 2 to 6 generations column 10 line 64).

45. Regarding claims 70-73, 79, 80, 87 and 88, applicants claim formulae of the dendritic polymer generation and intermediate branches that applicants have admitted are commercially available and anticipated by PAMAM dendritic polymers (page 17 2nd paragraph of specification). Henceforth the dendritic polymers of Killat et al., being of PAMAM structure and having biphosphonic terminals, anticipate these claims.

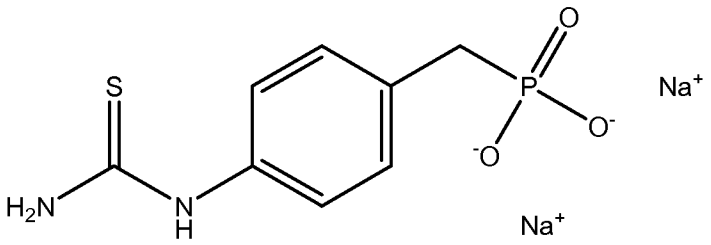
46. Claims 54-56, 58, 60-63, 70-73, 79-83, 87 and 88 are rejected under 35 U.S.C. 102(b) as being anticipated by Matthews et al. (US 6,464,971 B1).). In Example 24, Matthews et al. disclose a dendritic polymer having a PAMAM (4.0)

(generation 4) structure with a core of ethylene diamine (column 22 line 42) having sodium(phosphonomethyl)phenylthiourea terminals (column 22 lines 39-40).

47. Regarding claim 54, applicants claim a dendritic polymer of generation 0 to 12, a central core of valence of 1 or more, generation and optionally intermediate chains, a terminal group at the end of each intermediate chain represented by the formula (I):

$$-(A1)<[A2\text{-}P(=O)(OX)_2]_2 \qquad (I)$$

wherein A1 represents the radical --CR< or -Heteroatom<; the radicals A2, which are identical or different, each independently of the other represents a single bond or a linear or branched hydrocarbon chain having from 1 to 6 chain members; X represents a radical -alkyl, -Aryl, -H or /M where M is a cation. The dendritic polymer of Example 24 of Matthews et al. is of generation 4, with a central core molecule of valence of 4, generation/intermediate chains, terminal groups of the formula:



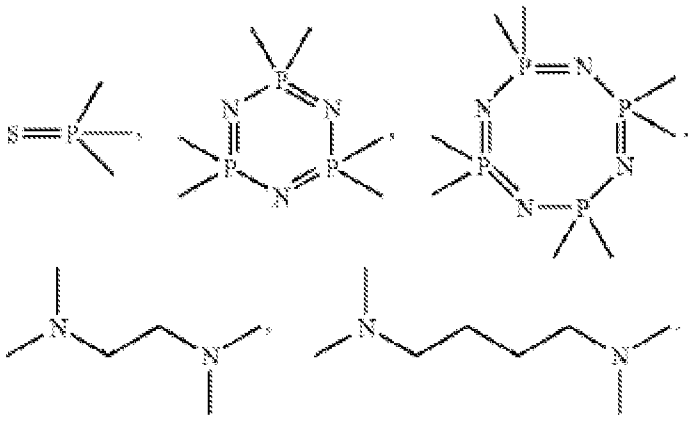
sodium 4-(phosphonomethyl)phenylthiourea

wherein X is a Na^+ ion. The terminal groups are attached to the dendrimer by reacting sodium 4-(phosphonomethyl)phenylisothiocyanate with the $-NH_2$ at the end of the PAMAM dendrons. During the reaction, at least some of the $-NH_2$ groups will react with two sodium 4-(phosphonomethyl)phenylisothiocyanate molecules, resulting in biphosphonic terminal groups. Henceforth the terminal groups will be biphosphonic wherein A1< is N<; A2 is C(=S)-NH-Ph-CH_2 (a 4 membered hydrocarbon chain).

48. Regarding claim 55, applicants claim a dendritic polymer having a structure of the DAB, PAMAM, or PMMH type. The dendritic polymer of Example 24 of Matthews et al. is of the PAMAM type.

49. Regarding claim 56, applicants claim the dendritic polymer wherein A1 represents the radical -CH< or -N<. The dendritic polymer of Example 24 of Matthews et al. has an A1 that is the radical -N<.

50. Regarding claim 58, applicants claim a dendritic polymer wherein the central core contains at least one phosphorous atom or is selected from the following groups:



The dendritic polymer of Example 24 of Matthews et al. has ethylene diamine (EDA) as the central core molecule (column 22 line 42).

51. Regarding claim 60 and 61, applicants claim a dendritic polymer with a central core molecule with valence of 1 to 8 and further limited to 3, 4, or 6. The dendritic polymer of Example 24 of Matthews et al. has a core of EDA which has a valence of 4.

52. Regarding claim 63, applicants claim a dendritic polymer with generation chains which are linear of branched hydrocarbon chains having from 1 to 12 chain members which may be heteroatoms and optionally substituted. The polymers of Example 24 of

Matthews et al. have PAMAM structure which has a generation chain that is a seven membered hydrocarbon with two nitrogen heteroatoms.

53. Regarding claims 70-73, 79, 80, 87 and 88, applicants claim formulae of the dendritic polymer generation and intermediate branches that applicants have admitted are commercially available and anticipated by PAMAM dendritic polymers (page 17 2nd paragraph of specification). Henceforth the dendritic polymer of Example 24 of Matthews et al., being of PAMAM structure and having biphosphonic terminals, anticipates these claims.

54. Regarding claims 81 and 82, applicants claim a dendritic polymer wherein M^+ is an element of group IA, IIA, IIB, or IIIA or further claim M^+ is a sodium or potassium atom. The dendritic polymer of Example 24 of Matthews et al. has Na^+ for M^+.

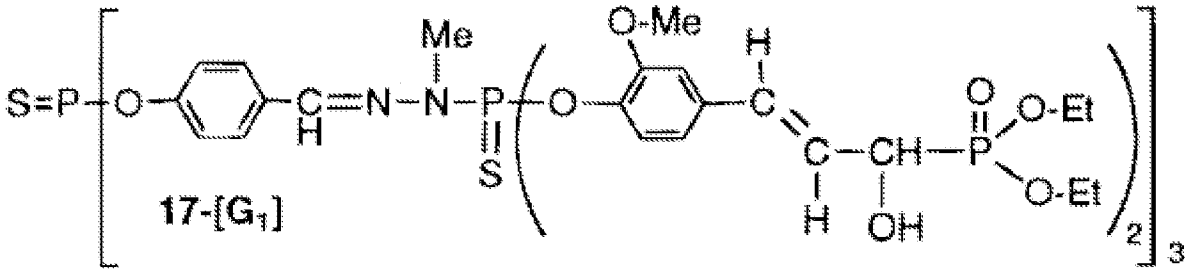
55. Regarding claim 83, applicants claim a dendritic polymer wherein the generation chains are identical. The polymers of Example 24 of Matthews et al. have PAMAM structure which has identical generation chains.

56. Claims 54, 58, 60-66, 68, 69 and 83 are rejected under 35 U.S.C. 102(b) as being anticipated by Prévôté et al. ("Phosphate-, Phosphite-, Ylide-, and Phosphonate-Terminated Dendrimers." J. Org. Chem. 1997, 62, 4834-4841. American Chemical Society, Colombus, OH, USA).

57. Regarding claim 54, applicants claim a dendritic polymer of generation 0 to 12, a central core of valence of 1 or more, generation and optionally intermediate chains, a terminal group at the end of each intermediate chain represented by the formula (I):

$$-(A1)<[A2\text{-}P(=O)(OX)_2]_2 \qquad (I)$$

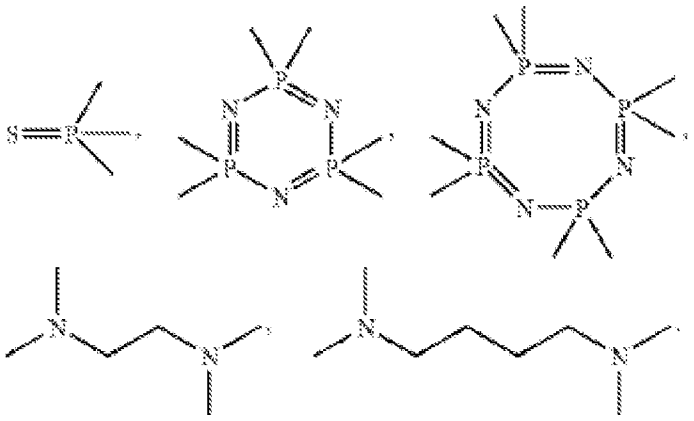
wherein A1 represents the radical --CR< or -Heteroatom<; the radicals A2, which are identical or different, each independently of the other represents a single bond or a linear or branched hydrocarbon chain having from 1 to 6 chain members; X represents a radical -alkyl, -Aryl, -H or /M where M is a cation. Prévôté et al. disclose a dendritic polymer 17-[G_1] of generation 1 with a core molecule valence of 3, generation and intermediate chains, and terminal $P(=O)(OEt)_2$ terminal groups (Scheme 8 page 4838). The dendritic polymer is of the formula:



17-[G_1].

The biphosphonic terminal groups are in parentheses and wherein A1 is P; A2 is -O-anisole-CH=CH-CH(OH) (a five membered hydroxy substituted hydrocarbon chain); and X is an alkyl group specifically ethyl.

58. Regarding claim 58, applicants claim a dendritic polymer wherein the central core contains at least one phosphorous atom or is selected from the following groups:



The dendritic polymer 17-[G_1] has a core molecule of S≡P≡.

59. Regarding claims 60 and 61, applicants claim a dendritic polymer with a core with valence 1 to 8 or further limited to 3, 4 or 6. The dendritic polymer 17-[G_1] has a core with valence 3.

60. Regarding claim 62, applicants claim a dendritic polymer of generation 0 to 3. The dendritic polymer 17-[G_1] is generation 1.

61. Regarding claims 63-66, 68 and 69, applicants claim generation branch compositions elected from linear or branched hydrocarbon chains having from 1 to 12 chain members wherein the generation chains are of the formula:

-A-B-C(D)=N-N(E)-(P(=G))<

wherein in the most limited embodiments A represents an oxygen atom; B represents a substituted or unsubstituted phenyl ring; D represents a hydrogen atom; E represents a radical alkyl; and G represents a sulfur atom. Prévôté et al. disclose the structure in 17[G_1] having the same formula as represented above wherein A is an oxygen atom; B is an aryl group namely phenylene; C is a carbon atom; D is an hydrogen atom; E is an alkyl radical namely methyl; and G is a sulfur atom.

62. Regarding claim 83, applicants claim a dendritic polymer having identical generation chains. The dendritic polymer 17-[G_1] of Prévôté et al. has identical generation chains.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL DOLLINGER whose telephone number is (571)270-5464. The examiner can normally be reached on Monday - Thursday 7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/D. Lawrence Tarazano/
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